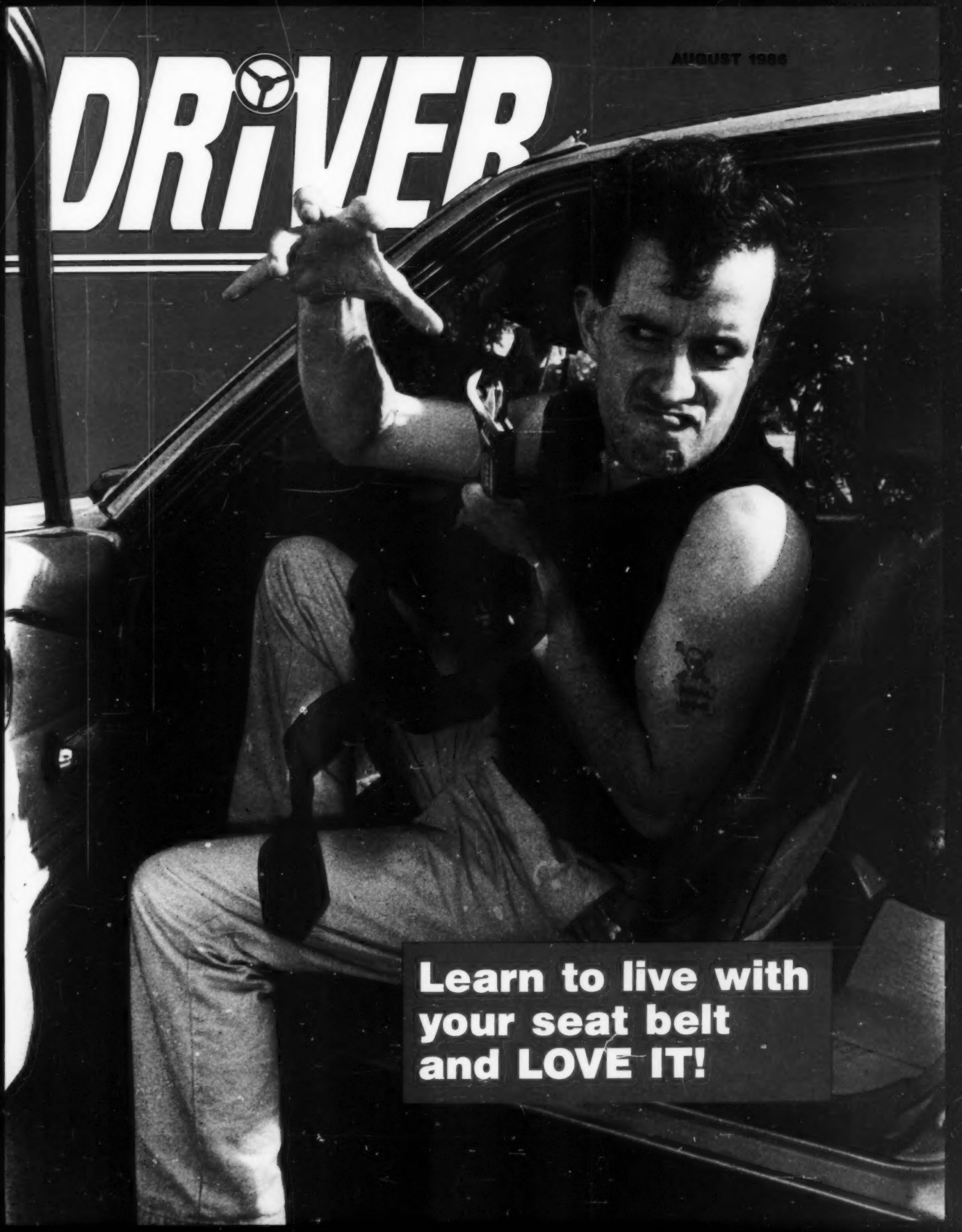
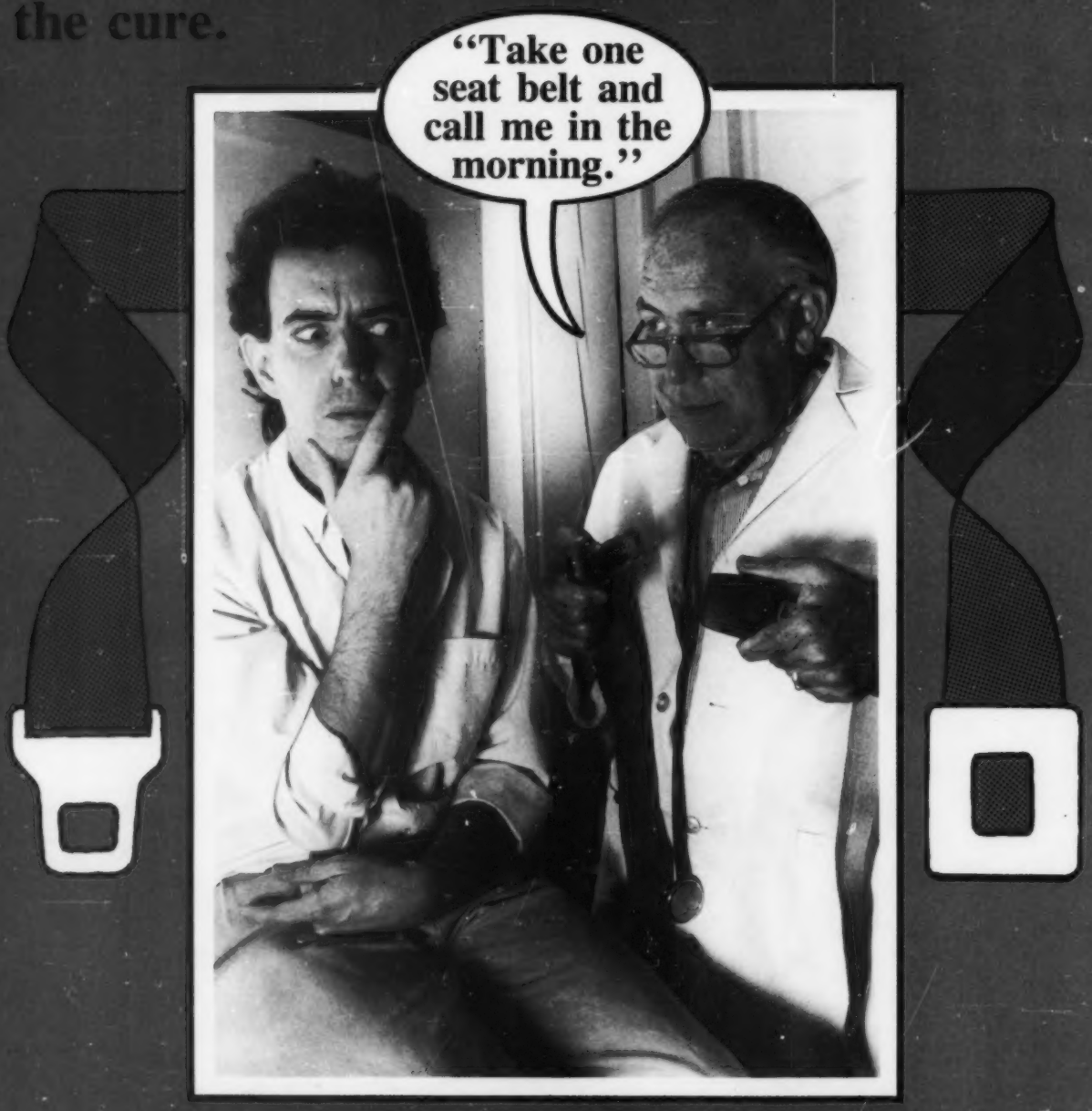
DRiVER

AUGUST 1986



Learn to live with your seat belt and LOVE IT!

Auto accidents are a health problem. Here's the cure.



PREVENTIVE MEDICINE

Note: Much of the information in this article is contained in studies of seat belt use and effectiveness of the Society of Automotive Engineers. Our thanks to the SAE.

It sounds like a disease epidemic.

The U.S. Surgeon General has called traffic accidents a "major public health problem." Recent figures from the National Center for Health Statistics listed motor vehicle accidents as the fourth most common cause of death for Americans, after heart disease, cancer and stroke.(1)*

But auto accidents are the *leading* cause of death for the younger portion of the population of the United States. For all those age 5 to 34 auto accidents were *number one*. For those age 35 to 44 traffic accidents were third; only cancer and heart disease claimed more lives.

Hold on; it gets worse. Here's what being "number one" means: *Among those age 15 to 19, car crashes accounted for 45% of all deaths*, according to a recent study. *For the 20 to 24 group, it was 35.7%*. If you're a young adult, you are more likely to die in an auto accident than from any other cause. Men age 15-24 are three times more likely to die from motor vehicle accidents as from any other cause. Women are more than twice as likely to die from auto crashes as from other causes. (In this age group, three and a half times more men die than women.) (1)

So it has the same effect as a disease, but it isn't a disease. The fourth most common killer of Americans — and the *leading* killer of young Americans — gets far less attention than many less deadly problems.

85.8% of U.S. drivers wear their seat belts this way, unbuckled. Yet, if they all wore the belts, death and serious injury could be reduced by 50% each year.

CHOICE LIFESTYLE

What allows this particular killer to go on?

Canada's National Health and Welfare has reported (1) that auto crash deaths are mainly caused by "lifestyle factors," that is, risks taken by the individual — not using belts, driving while intoxicated, speeding, etc. People, by making a conscious choice not to wear the belts, allow the death toll to remain high.

People make choices to avoid many dangers that have only a remote possibility of occurring, but they won't use the seat belts that are installed in every car for the much more likely event of an accident.

Of course the likelihood of an auto accident on any one trip is small. But the likelihood that you will have a serious accident sometime during your life is *more than 50%*. As it has been said, "You may only need your seat belts once, but *which* 'once'?"

YOUNG MEN

How bad a problem is the non-use of seat belts?

A study of 19 cities once showed that 85.8% of all drivers observed were not wearing seat belts.(1) This is no isolated case; usage studies commonly show low rates for buckling up, at least in those areas without mandatory seat belt use laws. People don't wear them, particularly young men.

A report of Australian drivers (2) stated, "Surveys have shown lower than average seat belt wearing rates are most likely to occur in the following types of vehicle occupants: Back seat passengers. Rural travellers. Night travellers. Drinking drivers. *Young male drivers*." (Italics

continued

* Numbers in parentheses refer to references at the end of the article.

THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

AUGUST 1986

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ours) Note, that is "lower than average," and average rates are not high.

A Swedish report (3) stated, "It is particularly *younger men* who represent a low degree of seat belt utilization."

And yet, look at the fact sheet we've printed on page 7. 35,000 people die each year in cars, light trucks and vans that are equipped with belts. Half of these people could be saved if they simply wore the belts.

CRASHWORTHY

Instead of thinking about using the seat belts, which are easy, effective — and universally available — life-saving devices, people concentrate on the vehicle.

One report (1) severely criticizes "the belief that the most active thing people can do to protect themselves in the event of a motor vehicle crash is to be driving a 'safe' car." Even in a safer car a good restraint system will still be necessary. Indeed, instead of concerning oneself with a "safer" car, each driver should take action to *make* his or her car safer. How? By buckling up. The report compares seat belt use to "preventive medicine."

A "safer" car is often a larger, heavier car. People feel safer in a big car, and they actually are safer, all other things being equal. However, it is possible to get big-car protection even in a small car. How? You guessed it — by buckling up.

Concerning the risk of injury in an accident, one report suggests that fastening your seat belt can have the same effect as making your car 1,800 pounds heavier.(4) The odds of injury for a belted driver in a 2,500-pound care are the same as for an unbelted driver in a car that weighs 4,325 pounds, truly a "tank" by today's standards.

No matter what kind of car you drive, a buckled seat belt will reduce your likelihood of being injured in a car crash. If a belted driver and an unbelted driver are driving the same size cars, the belted driver will have a 66% lower chance of injury.(4)

It is especially important to wear the belt in a newer, smaller car because the chance of hitting the windshield is greater in a "down-sized"car. This is due to the fact that the occupants are so much closer to the front structure of the car.(4)

PAIN IN THE NECK?

So now you have the idea. It is just good preventive medicine to fasten that nylon belt around you. But now we want to make a plea for the shoulder straps of

continued

Imagine jumping off a three story building head-first and catching yourself with your hands. Don't think you could do it? Well that's how strong you'd have to be to stop yourself from hitting the dashboard in only a 30-mph car crash.

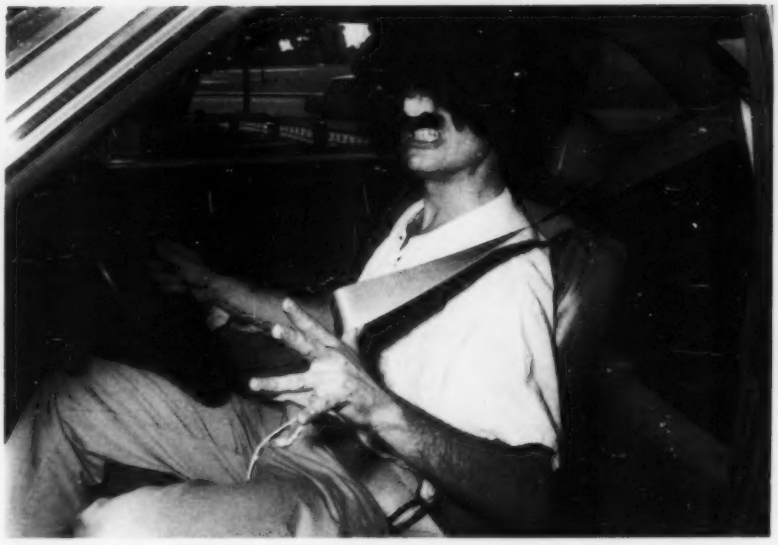
the seat belts, which are designed to keep the head and upper body away from steering wheel and dashboard. Belts in most positions in the car are equipped with them, but a lot of people complain about them, just as they would about a necessary but distasteful medicine.

In a study of a sample of French drivers (5), 80% used belts. (France is, of course, one of the countries with a mandatory use law.) 10% of those who used the belts thought they were a constraint to the driving task. Some said the belts were badly fitted to the body. 75% of those were women. Most were under 5'4", and some complained that the belts rubbed on their neck or "strangled" them.

A few were dissatisfied with the retractors on the belts. Some disliked the feeling of pressure on the body, and a few complained of twisting of the belts or difficulty in getting them to unwind.

These are common complaints that one hears all the time, and many people use them as excuses for refusing to wear the belts.

The reasons for not buckling up might be convincing to some, but it is important to understand what happens during an accident that makes the belts vital.



If you don't like the feel of a belt against your chest, consider that they aren't effective this way. To reduce the chance of death and injury, they have to be kept snug.

THE HUMAN COLLISION

When a car traveling at 30 mph hits a wall, it comes to a complete stop within one tenth of a second. However, if the driver is unbelted, he/she is still moving along inside the car at 30 mph. It will take the driver about one-fiftieth of a second more to hit something — say, the windshield or the steering wheel. That's what is called the human collision. It happens about 0.02 seconds after the automobile's own impact, and belts can make a big difference in determining how serious that human collision is. A lot of people think they are strong enough to brace themselves in a crash. They aren't. At just 30 mph you would be thrown toward the dash with the same force as if you had jumped head first off a three-story building. No one's arms are anywhere near strong enough to "catch" himself and break a three-story fall. Safety belts are, though. And that's why people need them, even in a low-speed crash.

JOLT

Of course, just as it is important to wear the belt and shoulder harness, how you wear it is equally important. You must wear the shoulder strap snug against your chest. One researcher puts it this way: "In a crash situation, any slack in the chest strap significantly reduces its effectiveness in preventing injury. The critical factor is not how fast you stop, but how far you travel after you begin to stop."(6) The report says that deceleration would be harmless to the human body, except for the forces that result from it. The important force is called "jolt," which occurs when the body decelerates very quickly. Jolt is measured

"NOTHING BAD EVER HAPPENS TO ME"

There's a popular bumper sticker that begins "Everybody has to believe in something . . ." A Swedish study found that most people believe that the risk of a traffic accident is a small one.(3) People truly believe "it can't happen to me."

To test the difference between what people *say* they believe and what they *actually* believe, the Swedish researchers interviewed people about their attitudes, and then hypnotized them and interviewed them again.

Here's what they discovered: ". . . there is a subconscious evaluation of the subjectively low level of risk experienced . . . Without hypnosis the following facts were stated: The people concerned were afraid of being involved in an accident. That road safety work was important. That excessively high speed was a contributory cause of accidents. Under hypnosis the following was stated: that the person concerned did not feel any fear of being involved in an accident; such a thing could purely and simply not happen. That a seat belt was unnecessary." Further, the majority of men (50 to 75%) thought they were more skillful than other drivers.

It's amazing: Deep down inside, people believe an accident "could purely and simply not happen." And yet, for thousands of people each year, it does happen. And 45,000 or more of them die.

in G forces, just like in the space program.

The body can handle a lot of G forces, as long as they aren't applied too quickly. In a car crash, however, they are applied too quickly.

Time is the critical factor here. A moving body can decelerate slowly, or it can decelerate quickly when it hits something. If it hits the belt a split second after the car crash, the body had a "second collision" of its own, a bad one. If the shoulder strap is worn snugly against the chest, the body becomes part of the car (for crash purposes) and it decelerates more slowly, along with the car.

CUT THE SLACK

After a crash, the deceleration begins as soon as forward movement of the car is impeded. If there is slack in the chest strap, the person's body continues forward until it hits the strap, usually causing blunt-force trauma.

This is why the report (6) concluded, "The chest strap is effective only when in contact with the chest." It went on to explain that people "will not receive the full potential protection from buckling up unless they reset the shoulder strap after nearly every voluntary forward motion of their body in a non-crash situation."

Large cars may be safer, but if you wear your belt in a 2500-pound car your chances of avoiding injury are as good as the person in a large, 4300-pound car.

LEFTOVERS

Here are a couple of other concerns: Some people worry about possible injuries from the use of the belts and shoulder harnesses. It is important to understand that there can be injuries caused by the safety belts, but these are very minor, especially when compared to the major injuries suffered by unbelted occupants.

One report stated, "Belt wearing not only prevents severe and fatal injuries, but also less severe injuries to a great extent. Belt wearing reduces the total risk of injury by more than 35%. Belt wearing primarily reduces head injuries and severe chest injuries. Due to belt use, there is a small increase in minor to moderate chest injuries. Most of these are bruises and slight pain, however."(3)

In accidents between same-sized cars, the belted driver has a 66% better chance of avoiding injury than does the unbelted driver.

Another concern is the interest in the automotive "air bag," which some people believe is a cure-all for the risk of car accident injuries. However, experts say "the lap-shoulder belt is more effective than the air bag but that the air bag is only more effective when the lap belt is worn."(7) Therefore, even *with* an air bag, belts are necessary. Why not get in the habit of using them?

LAWS

One thing that can be done to encourage belt use, obviously, is the passage of seat belt laws. They *do* help. Consider:

There has been a mandatory seat belt law in Australia since 1970. An Australian report (2) stated there had been a decrease in deaths since the law went into effect, from 8.1 deaths per 10,000 vehi-

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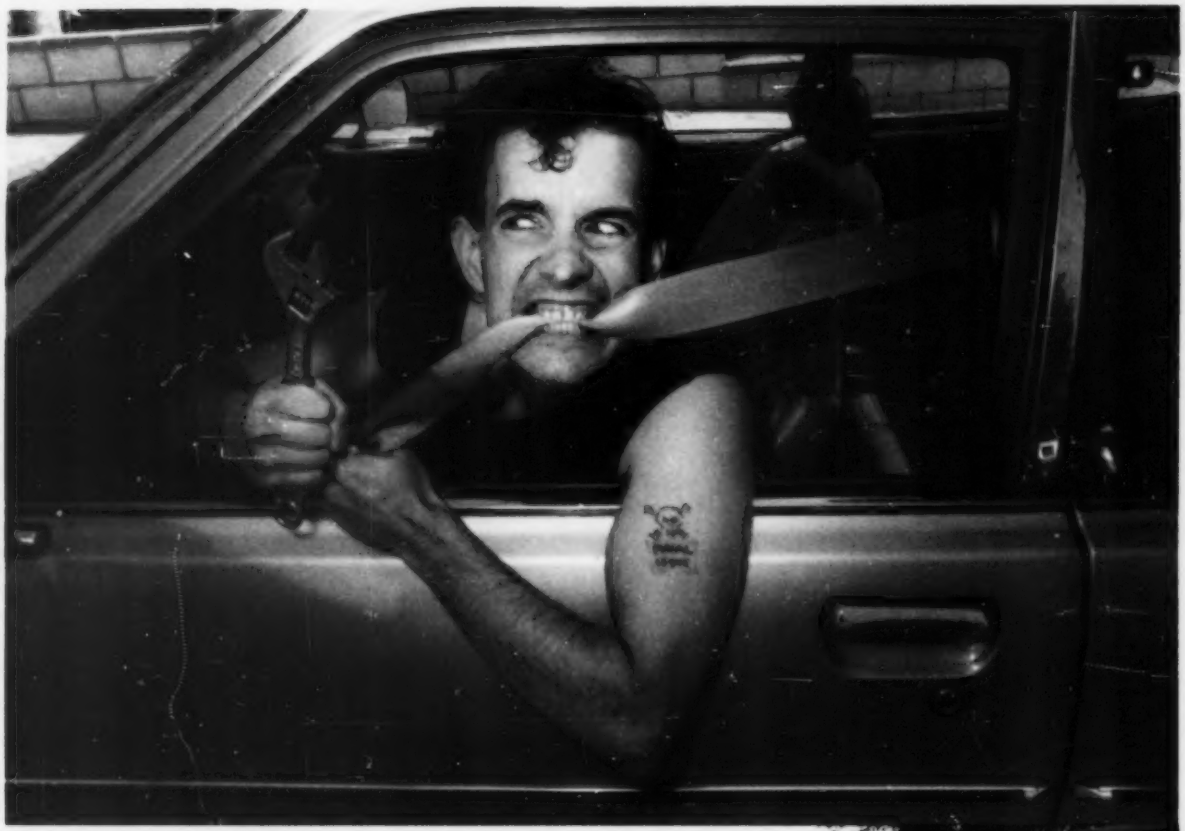

Maybe it's a "macho" attitude that makes them want to discard the belt, but younger men are less likely to buckle up than any other group.

cles driven to 3.4 deaths per 10,000 vehicles. One hospital reported a significant drop in the number of vehicle crash victims admitted since the law, but no significant drop for the other road user categories, pedestrians and motorcyclists.

Sweden introduced a mandatory seat belt use law in 1975. Swedish reports calculated a 12% decrease in fatalities and a 20% drop in serious injuries since that time.(3)

Closer to home, the California Highway Patrol reported that the death toll on California highways had dropped 11% for the first four months of 1986, compared with 1985. (In the month of April alone, the rate was 20% less than the same month a year earlier.) They give the credit to California's mandatory seat belt use law, which went into effect on January 1. (It is important to note here that these figures are significant even though the law is not being actively enforced.)

We are not necessarily calling for mandatory seat belt laws across the country. (Currently, belt laws are on the books in 26 states.) Basically, we want whatever works to encourage people to take their "preventive medicine."

Yes, laws work. So do seat belts. Use yours.

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1. "A Preventive Health Orientation in Safety Belt and Child Safety Seat Use," David A. Sleet, Office of Driver and Pedestrian Research, NHTSA, U.S. Department of Transportation, Washington,

SAFETY BELTS MAKE A DIFFERENCE

■ Approximately 35,000 people die annually in cars, light trucks or vans *equipped* with safety belts.
■ About 50 percent (17,000) of these people could be saved if they *wore* safety belts.
■ Safety belts cut your chances of being killed or seriously maimed in a crash by about 50 percent.
■ On any single vehicular trip the chance of an accident is very low; but the possibility of a serious accident on one of the many trips in your lifetime is better than 50 percent. (What percent of your friends have never been in an accident? Ask around . . . the percentage will be low.)
■ Three out of four crashes happen within 25 miles of home.
■ A common cause of death and injury to children in automobiles is being crushed by adults who are not wearing safety belts. In fact, one out of four serious injuries to passengers is caused by occupants being thrown into each other.
■ Drivers wearing safety belts have more control over their car in emergency situations and are therefore more likely to avoid an accident.
(National Highway Traffic Safety Administration)

Shorter people complain that the shoulder strap on seat belts "strangles" them. We think this is an over-reaction.

After each forward movement, you should reset the shoulder strap so it is snug against your chest. This is the only way it is sure to be effective.

D.C. (SAE Technical Paper Series #840325)
2. "Thirteen Years of Seat Belt Usage — How Great the Benefits," Gordon W. Trinca, Road Trauma Committee, Royal Australasian College of Surgeons. (SAE Technical Paper Series #840192)
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6. "Effectiveness of Seat Belts," Thomas G. Dickinson, Dickinson, Belmont & Shewmake, M.D., PA (SAE Technical Paper Series #840570)
7. "Clinical Case Studies of Lap-Shoulder Belt Effectiveness in Passenger Car Crashes," Donald F. Huelke, Department of Anatomy & Cell Biology and The University of Michigan Transportation Research Institute, Harold W. Sherman and Audrey F. Elliot, The University of Michigan Transportation Research Institute (SAE Technical Paper Series #840197)

All numbered papers are contained in Society of Automotive Engineers publication P-141, *Advances in Belt Restraint Systems: design, performance and usage.*

It's your choice

Regardless of who's fault it is, when a motorcycle is involved in an accident the rider(s) suffers. This is especially true for those motorcyclists who insist on giving up all control and laying the bike down.

For whatever reason, once the motorcycle is down the rider(s) is exposed to myriad hazards that impact, rip and tear his or her body. Of course, there is gear the rider(s) could wear to lessen the damage caused by these hazards.

The first line of defense is the safety helmet. Other items that temper the effects of an accident include gloves, boots and high quality outer garments.

The effectiveness of helmets has been stated over and over again, but not as much emphasis has been placed on how the other items perform in accidents.

To this end, a study was conducted in the Munich, West Germany, area[1]. The study examined the effectiveness of motorcycle clothing.

To begin with, 30 percent of the accident victims who were wearing protective clothing were not injured.

Of the injured, 76 percent of the riders who were wearing motorcycle clothing spent an average of one week less in the hospital than those who weren't. Correspondingly, the non-wearers missed 20 days more work or school than those who dressed with motorcycle clothing.

As compared to unprotected riders, those who wore protective clothing suffered 40 percent fewer permanent physical defects.

If the 30 percent non-injury victims are included, then those who didn't wear protective clothing spent 15 days more in the hospital. Likewise, those who failed to dress for the ride missed 45 days more work than those who did wear motorcycle gear. And the protective gear wearers had 60 percent fewer permanent physical defects.

It almost goes without saying that motorcycle clothing (in addition to the safety helmet), such as heavy boots, leather garments and gloves, is effective in preventing or reducing abrasions and lacerations. This is particularly true for the upper body and extremities. Proper motorcycle gear reduces the frequency and extent of abrasions and lacerations of the skin and soft tissues as well as protecting open wounds against dirt.

Open injuries are a major problem in motorcycle accidents because they generally delay the treatment of fractures and involve the risk of wound infection.

The material used to make motorcyclists' outer garments is very important. It must have high tensile strength and abrasion resistance. While there are no fixed standards or guiding values, high quality leather is the current material of choice. However, various synthetic materials have similar properties and afford better protection against wetness.

Highgrade motorcycle clothing also has crash padding for particularly endangered parts of the body.

For complete protective outer garments the motorcyclist should wear:

- A full-coverage, approved safety helmet.
- Gauntlet gloves with padding over the back of the hand.
- Jacket and trousers (or combination suit). The preferred zones for padding are the shoulders, elbows and forearms in jackets. And the hips as well as the front and outside knee zones in trousers.
- Boots with crash padding for the shins, ankles and insteps.

Mostly, protective padding is made of the same material as the garment. Sometimes there is a single reinforcing layer only. However, more often there is an intermediate layer of padding. Sometimes there are even rigid shinguards of metal or plastic.

If there is any question about how valid these figures are, consider that the Official West German accident statistics for 1983 recorded 1,850 dead and 99,756 injured motorcycle riders. Per driven mile that is 13 times more accident fatalities and 17 times more injured than in the case of automobile occupants. Approximately 80 percent of the accidents involved riders younger than 25.

If You Don't Wear Protective Clothing You Might:

- **Spend 15 days more in the hospital;**
- **Miss 45 more days of work, and/or,**
- **Have a 60% greater chance for permanent physical defects**

[1] **Society of Automotive Engineers Technical Paper Series #860498, "Disability and Impairment of Protected and Unprotected Motorcycle Riders", by Erich Schuller, Gundolf Beier and Wolfgang Spann, Institute of Forensic Medicine, University of Munich. The paper is available for $4.50 from: SAE, 400 Commonwealth Drive, Warrendale, PA 15096.**

True Accidents

Following are a few reports of accidents involving Air Force members. We have removed names and references to dates and places.

SPEEDING DRUNK

About 9:45 p.m., a technical sergeant was driving east at very high speed on a four-lane undivided city street. Going downhill, the car veered into the westbound lanes, passing two cars at nearly 100 mph. When he tried to steer back into the eastbound lanes, the car skidded for 250 feet, crossed both lanes, jumped the curb and slid on the grass for 230 feet before hitting a wooden utility pole head-on. He died of massive head and chest injuries. His Blood Alcohol Level measured .18.

ASLEEP

About 9:55 p.m., an airman was driving north on a highway. The car crossed the center line and the opposite lane of traffic, hitting a reflector pole and then a concrete bridge abutment. It glanced off the abutment and went back across the road, colliding with the bridge railing. The airman received fatal injuries in the impact with the abutment. Since there was no evidence of violent action of the vehicle and no drugs or alcohol involved, investigators concluded he had fallen asleep at the wheel. They said he would probably have lived if he had been wearing his seat belt.

ILLEGAL LEFT TURN

About 5 p.m., an airman left base in his pickup truck to drive 60 miles to his parents' home. He had dinner there and left at 10 p.m. to visit a friend who lived nearby. They drove around and stopped in a small town for a meal. About 11:30, they left and then decided to return to the business section of the town. The road had three lanes, the center lane for left turns only. The airman made an illegal left turn from the right lane of the road, intending to turn around. Another pickup carrying four civilians was traveling illegally in the center lane, speeding above the 40 mph limit. It hit the airman's truck at the driver's door. The airman was killed and all the others received multiple injuries. No one was wearing a seatbelt. The civilian driver was charged with driving while intoxicated.

THREE DEAD

At about 1:30 a.m., a sergeant and two airmen were riding in a pickup, returning from a fishing trip; the sergeant was driving. All three had been drinking, and although seat belts were available for all three, nobody was wearing a belt. Their route was a narrow dirt road with potholes. After a straight stretch in the road, there was a 90-degree left curve leading to a narrow, wooden bridge which was unmarked and unguarded. The bridge spanned a 40-foot-wide drainage ditch, 4-5 feet deep with water and soft mud. Traveling at 30 to 45 mph, the pickup went off the right side of the road at the 90-degree bend. The driver braked as the truck left the road, causing a 180-degree spin. The truck went down a steep embankment and overturned into the ditch. All three men drowned. The sergeant's Blood Alcohol Level (BAL) measured .16; the two airmen had .08 and .03.

SKID

An airman and a female civilian drank an undetermined amount of alcohol at a nightclub over a five-hour period. A third person drove them to his apartment complex in the woman's car. He left and the woman decided to take the airman back to the base. She had only driven a mile when she lost control on a 90-degree turn, due to excessive speed. Leaving 125 feet of skid marks, the car skidded onto a grassy median, hit a drainage ditch and overturned. The airman was partially ejected through the right front side window, and his head was crushed when the car landed on top of him. He died at the scene.

NO BELTS

An airman first class and a civilian friend left a disco where they had been drinking in the early morning hours. The civilian was driving when about 1:37 in the morning he allowed his car to drift across the center line of the street. The car collided head-on with another vehicle and the impact jammed the doors closed. When police arrived, they had to break a window to get the driver out, and the fire department had to use the "jaws of life" device to get the airman out. Neither man had worn the available seat belts. The airman suffered massive chest and body injuries and was pronounced dead at 2:25 a.m. The driver suffered head and chest injuries, but he recovered. He was charged with driving while intoxicated; his Blood Alcohol Level was .23, twice the legal level of intoxication. The driver of the other car had worn his seat belt and suffered minor head injuries; he was charged with speeding.

DARK VISOR

Four motorcyclists were driving west at high speed on a highway at about 8:45 p.m. One of them was a senior airman and another was his father. The airman was properly attired with boots, riding gloves and a helmet, but the helmet had a dark visor. At a left curve in the road the airman's motorcycle went off the pavement to the right, collided with an embankment, flipped over twice and hit a fence. The airman was thrown off the cycle at this point, 475 feet from where he left the road, and the cycle traveled another 340 feet before stopping. The airman was pronounced dead at the hospital at 9:30 from a broken neck and internal injuries. Investigators decided the mishap was caused by the airman's excessive speed, with reduced visibility from the dark visor as a contributing factor.

LEFT TURN

At about 2 a.m. an airman was riding his motorcycle along a major thoroughfare, returning to his residence. He was driving about 60 mph in a 25 mph zone. A car driven by a civilian turned left in front of him. Because of his speed he couldn't stop in time and his motorcycle hit the right door of the car. He was thrown over the top of the car and he hit the pavement 20 feet farther on. He was not wearing a helmet and received massive head injuries. He died later in the hospital. Police cited the car driver for failure to yield the right of way.

or not to borrow..."

"Neither a borrower nor a lender be for loan oft loses both itself and friend . . ."
— Hamlet, Act I, Scene III

Of course, Shakespeare wasn't talking about lending a motorcycle when he wrote these words, but he could have been. Any motorcycle owner should think twice before he loans his bike to another person, because he might lose both the bike and a friend, permanently.

It's no exaggeration. Our "True Accidents" file can provide some evidence.

One evening a man attended a party riding a borrowed motorcycle. Although he owned a helmet, he did not wear it. About 2:30 in the morning he left to take a friend home, and then went back toward the party. A witness saw him driving on a four-lane street at about 60 mph in a 35-mph zone. The cycle rider failed to negotiate a gradual left curve, hit a curb and was thrown head-first into the trunk of a tree. His Blood Alcohol Content was .18. He had not received any motorcycle training and he was not licensed to ride a motorcycle. He had received four moving violations in the last two years, three of them for speeding.

Another accident shows the result of a "ride around the block."

Two men drank beer for several hours one evening. About 1 a.m., one borrowed the other's motorcycle, saying he just wanted to go around the block. While riding at very high speed, he lost control of the motorcycle and it hit a metal guard rail. The collision threw him into the rail, tearing off his right arm, and he died about 45 minutes later in the hospital from massive blood loss and multiple injuries.

In another accident, everybody should have been walking.

Two men went to a friend's house at 9 p.m. after about five hours of drinking. One of them immediately asked to borrow the friend's motorcycle. He persuaded them to sit and talk for a while, and they each had another drink. About 9:45 the man borrowed the motorcycle and drove off, refusing the offer of a helmet. After about an hour, his companion went out looking for him because the cycle's owner had become worried.

He found the rider at home, arguing with his wife about riding the cycle while intoxicated. His wife had taken the keys away. After a discussion, the companion was given the keys so he could return the motorcycle. The cycle borrower went along. On the way, traveling at over 70 mph, they collided with a car in an intersection. Both were thrown off the cycle. The operater received a fractured pelvis and spent two months in the hospital. The passenger — the one who had originally borrowed the cycle — struck a tree and was killed. Neither man had ever received any formal motorcycle training.

SOBER

Not all accidents on borrowed cycles are the result of drinking. This one involves a non-drinker.

A man who was not an experienced rider borrowed a motorcycle from a friend; he was thinking of buying the cycle. He was riding east at 60 mph on a street posted for 50 mph. Another man was driving his car south on the intersecting street at 45 mph. The traffic light had been green for the car driver for about two to three seconds. The driver said he saw the approaching motorcyclist (who was wearing a helmet and a high-visibility vest) but thought the rider would stop. He didn't. The motorcycle hit the right side door of the car. The motorcyclist was thrown off, and he died at the scene from a broken neck. Investigators discovered he had received two speeding tickets in that same area, and that he had not received motorcycle training.

Here's another one involving someone who borrowed one cycle too many.

A certain man had a history of borrowing motorcycles from friends. He had never attended any motorcycle training of any sort, civilian or military, had no license, and had never owned a motorcycle. He was at a party when a friend arrived on a motorcycle. The two stood outside for a while telling riding stories and then the cycle owner offered to let him take it for a ride. He declined, saying he was afraid he might wreck the bike. Later, he told someone he felt "chicken" for refusing the ride, and then went back outside and borrowed the cycle and a helmet. He rode the cycle out of town for several miles, and then he lost control while speeding on a right-hand curve. The cycle hit the curb, went up on the sidewalk and crashed into a metal light pole. He was thrown onto the sidewalk, striking his head with enough force to sustain serious injuries despite the helmet. He died three days later in the hospital.

So sometimes the details are different. But whether the rider is drunk or sober, speeding or just being foolhardy, the fact is that many accidents occur after one person borrows another's motorcycle. In order to avoid losing both loan and friend, it may be time to start questioning yourself, just as Hamlet did.

"TO BORROW . . .?"

Whenever you think of asking to borrow someone's cycle you should ask yourself, "Do I really know how to handle this thing, or would I be better off if I got a little instruction?"

If that sounds too cautious, consider that riding a motorcycle is much more difficult and tricky than driving a car. Cycle riding calls upon your sense of balance, as well as the basic skills. A motorcycle is extremely unforgiving of any riding mistakes. If you don't know motorcycles, stay off. Even if you have experience, it is best to get the owner's instruction on that particular bike, in case it has any special idiosyncrasies.

You should also ask yourself, "Is this trip really necessary?" In other words, are you borrowing the bike to run an errand, or just to go on a "joy ride"? Make sure you're thinking responsibly and not showing off.

And you should ask, "What's my condition?" Alcohol seriously affects your balance, so stay off a cycle if you've been drinking. Similarly, fatigue is a bad condition for safe motorcycle riding.

"TO LEND . . ."?

Your responsibility, as owner, is greater because it is you who make the decision to lend or not to lend. So the things we mentioned for the potential borrower are things you should also be concerned with. And there are also questions for you to ask yourself.

"Is my friend an experienced rider? Does he know motorcycles, or is he just a novice?" Friend or not, if he is not an experienced rider, don't let him borrow the bike. It is just too dangerous to let a beginner take a sophisticated machine out for a spin.

"Has he ever ridden this bike before? Does he know about the adjustment of the brakes (or whatever)?" Try to think of everything he needs to know to ride your cycle safely.

"What condition is he in? Is he drunk or sober? Is he in good enough condition to safely handle my bike?" NEVER let an intoxicated person ride your cycle. Alcohol plus a motorcycle virtually *guarantees* an accident.

"What kind of person is he, basically? Is he immature? Is he likely to take chances?" You don't want a hot dog on your bike, any more than you'd want one behind the wheel of your car.

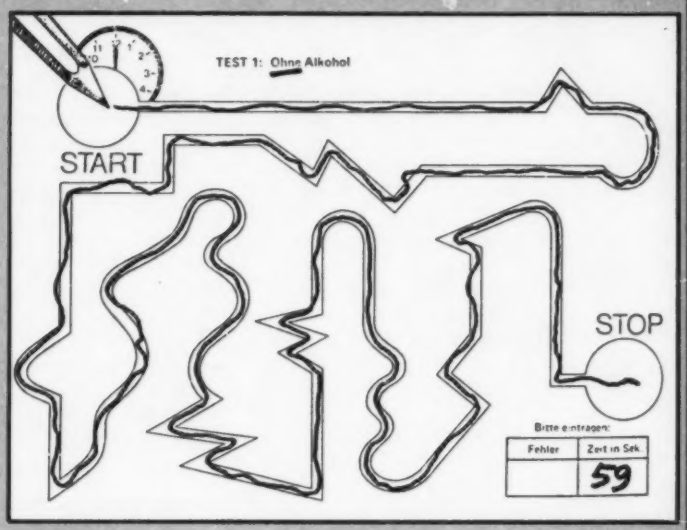
"Why does he want to borrow the bike? Does he really need it, or is he just trying to impress another friend with his riding ability?" The urge to show off could lead to taking chances.

If he is sober, responsible, mature and experienced, then perhaps it's okay to lend the motorcycle. If he's not, then you're both taking a great risk.

You see, friends don't always let friends have their way. Don't let your friend endanger himself. Take into account all the factors and then answer the question "to lend or not to lend." Make a wise decision — even if it isn't the choice your friend wants.

THE DRUNK DRIVING

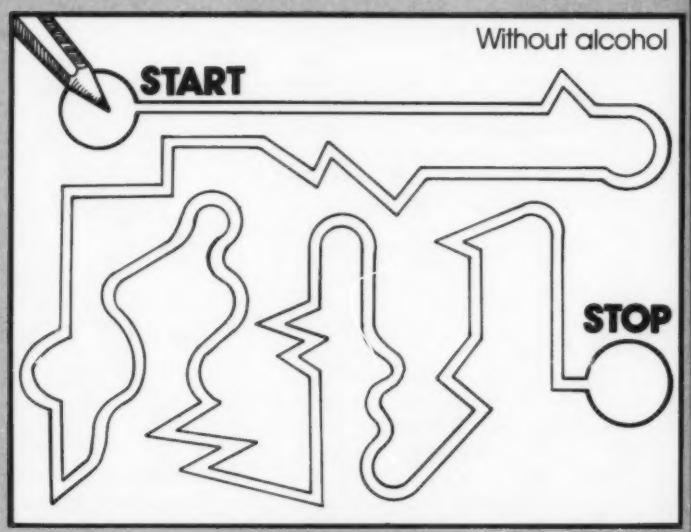
Squiggly Line Test



This test was specially formulated to test the skills of a person before and after imbibing (drinking) alcohol. The participant must try, in both instances, to use his left hand (or right hand in the case of a left-handed person). Try to follow the squiggly lines as fast and accurately as possible, while attempting to remain between the lines.

Should the pencil move outside the lines, a penalty is awarded. Part A of the test is to be undertaken without alcohol and Part B after the participant has had four beers.

In both cases the timing and the number of mistakes must be compared. The difference in scores on both A and B will determine the influence of alcohol.

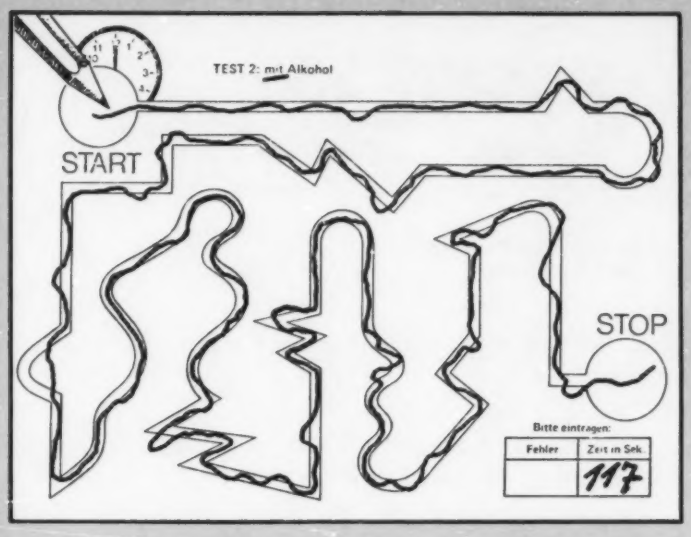


Mistakes . . . . .

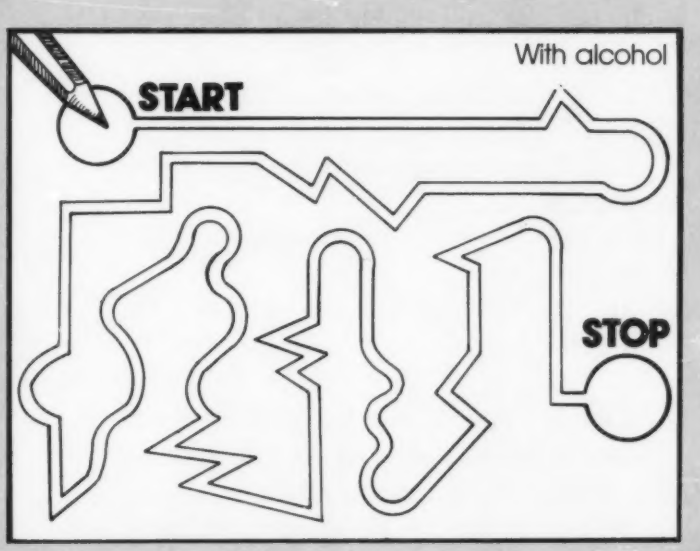
Time in seconds . .

The Signature Test...

PENCIL TEST



Editor's Note: This test was found in ROBOT, a traffic safety magazine published by the National Road Safety Council of South Africa. We reprint it here in the effort to make you think twice before you drink and drive.



. . . . . Mistakes

. . Time in seconds

During an evening of Snooker with friends, where alcohol was freely available, the participant, Udo Muller, signed his name at the start of the evening and every half-hour thereafter. Note the change in signature according to the increase of the alcohol percentage in his blood.

Test yourself during a social occasion. The end result should make you think twice before driving home.

DOUBLE

by Dorothy Radford
APO SF 96239

This poem first appeared in the Kadena SHOGUN

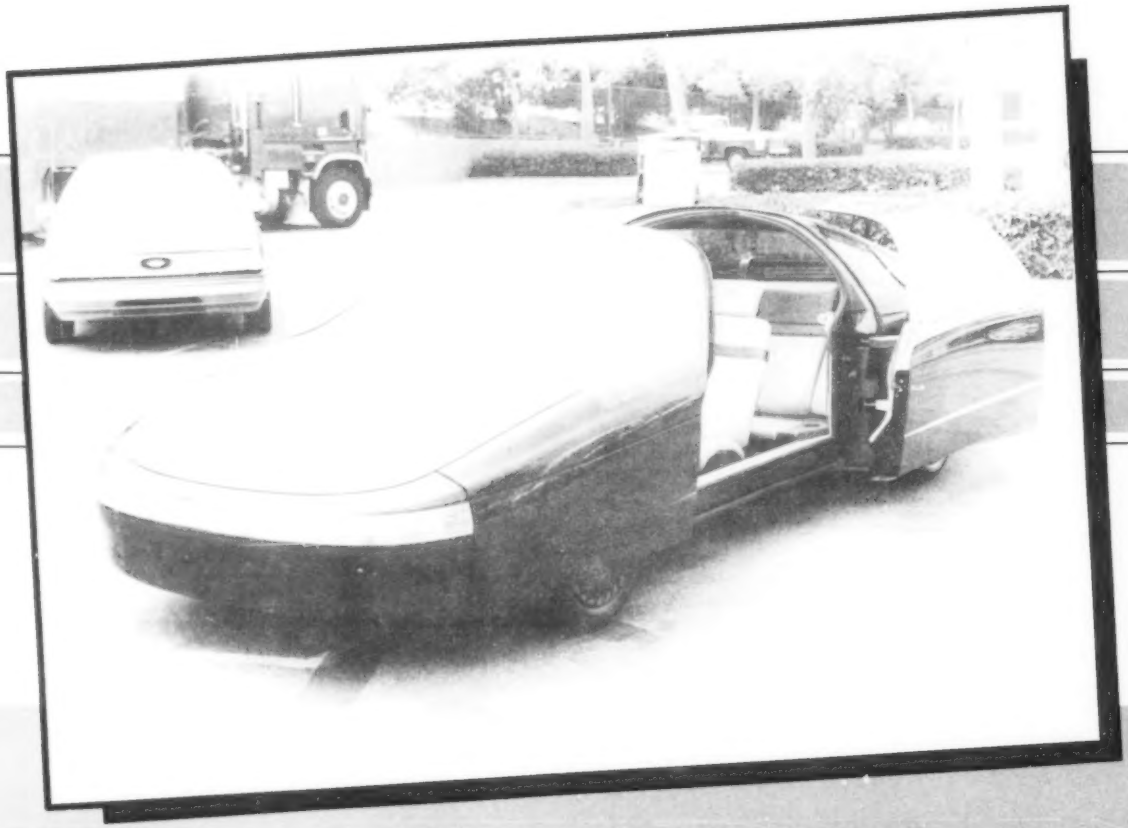
Sam de Sam stayed a little too long,
Imbibing in wine, women and song;
If told he was drunk, he would not agree,
In fact, he saw double what others could see.
So he climbed in both cars and put them in gear,
And used all four hands the two wheels to steer.
He knew he could drive cause he had what it takes,
He had two right feet, but also two brakes.

He felt so good; like he could fly,
His confidence was doubled so why not try?
Seventy, eighty, ninety, then floor,
He cursed his two cars cause they wouldn't do more.
Then he spied up ahead not one but two curves,
Two cars coming head on, but he had strong nerves.
He'd just slow down to 60 and then he would brake,
His thinking was clear, no decision to make.

TROUBLE

And he artfully slowed when he saw the two "yields,"
But his two cars went airborne straight for two fields.
Now two big black hearses could have ended this tale,
But he wound up quite alone in one single jail.
Three sober drivers ended up hurt,
And Sam lost his insurance, his car and his shirt.

So if you ever party and think you can drive,
Make a few tests when you leave that dive.
If you parked one car and find two in that lot,
You don't need a car, you need a cot.
Count your arms; if you come up with four,
And you still feel capable, count some more.
Count your lives, you've but one life to lose,
But you may take a dozen if you drive full of booze.



THINGS to COME?

We've been talking for a while about "heads-up" displays for vehicle instruments, and we've finally seen a working model. Ford has included one in a concept car it has designed called the Probe V. Perhaps we'll see such a device on a production car in the future.

(above)
Design ideas from cars like this Probe V do actually get into production. Aerodynamic styling from other concept cars found its way into the Ford Taurus (rear), which won the "Design of the Year" award from the Auto Expo International in Los Angeles.

(right)
This "heads-up" display enables the driver to receive readouts of key instruments without looking down. The readouts are projected on a screen mounted in the instrument cluster on the steering wheel. The cluster and steering column adjusts vertically, fore and aft to conform to dimensions of the individual driver.

Timely Topics

GM STANDARDIZES REAR SHOULDER BELTS

General Motors will make rear-seat lap/shoulder safety belts standard equipment in its passenger cars built in North America.

The belts will be installed in certain 1987 models. They will be installed in all vehicles by the end of the 1989 model year.

GM will be the first American automaker to standardize the rear-seat shoulder belts. They have been available as dealer-installed options since 1980.

The belts will be mounted in the two outboard rear seats. The center rear seat will continue to be equipped with a lap belt. (Automotive News)

STATES WITH MANDATORY SEAT BELT USE LAWS

In "Preventive Medicine" in this issue, we mentioned there are now 26 states which have mandatory seat belt use laws on the books. They are: California, Connecticut, Florida, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Tennessee, Texas, Utah and Washington. The District of Columbia also has a seat belt law.

FORD TO RECALL 420,000 CARS, TRUCKS

Ford Motor Co. is recalling approximately 258,000 cars and 162,000 trucks.

Included are about 162,000 1985 and 1986 gasoline-fueled, long wheelbase Ranger light trucks for possible correction of excessive evaporative emissions.

Ford said that the fuel tank vapor line may require rerouting.

The company will also recall approximately 258,000 1984 Ford Tempo and Mercury Topaz vehicles to replace bolts in the seat assembly. Ford said the two bolts that attach the driver's seat-back assembly to the seat-cushion frame may fracture during vehicle use. That could cause the seat back to recline.

The condition is alleged to have caused one minor accident and five minor injuries. (Automotive News)

MAZDA RECALLS 53,000 CARS

Mazda North America is recalling some 53,000 1982 RX-7 models because they exceed the federal emission standard for evaporative hydrocarbons. EPA found the non-compliance and Mazda agreed to the recall, which is the first for evaporative emissions.

The cars affected are from all 50 states.

At the manufacturer's expense, dealers will replace the charcoal canister in the engine compartment with a larger one. The Mazda canisters were adequate during prototype testing, but they failed later because of inadequate storage capacity.

Evaporative HC is about one-third of total HC emissions from motor vehicles.

NHTSA ANNOUNCES CHILD SEAT RECALL

Graco Children's Products, Inc., will conduct a recall of its Graco GT 1000 child safety seats because of a possible problem with the lever that adjusts the seat, the National Highway Traffic Safety Administration (NHTSA) said.

The federal safety agency said the problem could occur when the safety seat is in the infant (rear facing) position. Should the vehicle seat back interfere with the GT 1000's adjustment latching mechanism, the child will not be protected in the event of a crash.

NHTSA said it discovered the problem earlier this year in testing the GT 1000 for compliance with Federal Motor Vehicle Safety Standard No. 213, "Child Restraint Systems." The seat failed a crash test required by the safety standard.

NHTSA said there are an estimated 62,350 child seats involved in the recall and there are no reports of injuries. The agency said owners should take precautions — until their child seats are modified — to make sure the adjustment lever is properly latched when they use the device in the infant position. When the adjustment lever is properly latched, the GT 1000 will provide the intended protection, NHTSA said.

To correct the problem, Graco will provide, at no cost to the owner, a guard that will prevent a vehicle's seat back from interfering with the latching mechanism of the child seat. Graco will send the guard, along with instructions, to GT 1000 owners who call or write the company.

Owners may call Graco's customer service division toll-free by dialing 1-800-345-4109. Pennsylvania residents may call collect on 1-215-286-5951. Letters should be addressed to:

Graco Children's Products, Inc.
P.O. Box 100
Elverson, PA 19520

NHTSA said installation of the guard should take only a few minutes. Consumers who have problems or questions concerning the installation should contact the company.

Owners who feel that the remedy program offered by Graco has not corrected the problem may contact NHTSA by calling the agency's toll-free Auto Safety Hotline at 800-424-9393 (or 426-0123 in the Washington, D.C. metropolitan area).

1985 HIGHWAY FATALITIES DECLINE

Citing the decline of the highway fatality rate to the lowest level in history, Secretary of Transportation Elizabeth H. Dole said recently, "Last year fewer Americans died in traffic crashes than in 1984. In 1985 the fatality rate on the nation's highways declined to the lowest level in history and in the last five years, alcohol-related traffic fatalities declined by 25 percent.

"The decline in the fatality rate is especially encouraging since Americans increased their driving by three percent last year. Increased travel traditionally means more casualties," Dole said.

"The fatality rate, or number of deaths per 100 million vehicle miles of travel, dropped to 2.48 in 1985, down four percent from the 2.58 recorded in 1984 and more than 25 percent below the 3.34 rate in 1980," Dole said.

Statistics compiled by DOT's National Highway Traffic Safety Administration (NHTSA) showed 43,800 motor vehicle-related deaths in 1985, one percent fewer than the 1984 total of 44,257 and nearly 7,300 less than in 1980, when 51,091 people were killed. The figures include occupants of passenger and commercial vehicles, motorcyclists, bicyclists and pedestrians.

Historically, traffic deaths in the U.S. reached a high of 54,589 in 1972 and declined to 45,196 in 1974 when the oil embargo curtailed driving. Total traffic fatalities again climbed to more than 50,000 in 1978, 1979 and 1980, but have been declining since then.

When you accelerate there is a weight transfer to the rear wheels.

ARE YOU a HARMONIZED or 'STAB-N-STEER' DRIVER?

Bob Bondurant is probably the best known driving instructor in the world (especially among racing, high-performance, corporate and law-enforcement sets). His credentials include driving everything from street vehicles to World Driver's Championship Ferrari Formula Ones. Now he owns and operates the most successful high performance driving school in the world, Bob Bondurant School of High Performance Driving.

According to Bob, the primary goal of a driver is control, and control is accomplished through traction. Traction is the cohesive factor between the tires and the road surface.

The limits of traction are "determined by the tires, suspension, chassis, weight and balance of the car and the abrasive level of the road surface. Notice I first mentioned tires. The other components of this limit, each in its own way, affect the tires to either add or subtract traction."

Weight is continually transferred as a car accelerates, brakes and corners. The driver's goal is to make the weight transfer harmonize with the needs of the suspension and tires.

"If you are not accomplishing these transitions in one fluid motion," observed Bob, "then you might be one of those that I refer to as the 'stab-n-steer' group. . . .

"A typical stab-n-steer driver charges into a turn, executes a late, banzai braking attempt, does a herky-jerky downshift and jumps off the brakes (transfering the weight to the rear thereby reducing the traction available for steering). He next pounces on the throttle (putting even more weight transfer to the rear, making steering even more tricky) then has to come off the throttle because the car starts to either oversteer or understeer too much (coming off the throttle transfers the weight again to the front so the steering comes back). Then he is on and off the throttle and correcting the steering all the way around the corner. This is not safe."

As you brake there is a weight transfer to the front. Similarly, weight is transferred to the outside in turns.

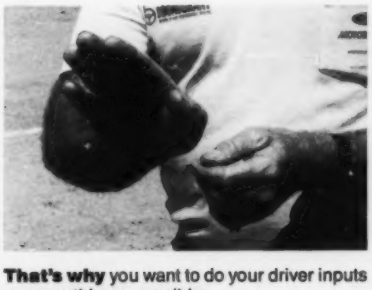
The Suspension, springs and shock absorbers extend when weight is transferred away . . .

more photos next page

. . . **While** the suspension, springs and shocks compress when weight is transferred to them.

The tire contact patch with the road may be this large when weight is transferred to it.

And only this small when weight is transferred away. The smaller the contact patch, the less the traction.



That's why you want to do your driver inputs as smoothly as possible . . .

. . . **To keep** the tire patch as constant and as large as possible.

Treat the brake pedal like a sponge . . .

. . . **Applying** more and more pressure.

Hold the steering wheel at the three and nine o'clock positions.

Because he drives them faster than 55 mph, Bob equips the vehicles he drives on closed racing tracks with a roll bar and racing-style five-point safety belts.

(middle, left and above)
Turn the steering wheel smoothly into the turn and then unwind it.

more crash 1986 test results

VEHICLE	SPEED/WEIGHT	HIC Driver/Pass	CHEST G'S Driver/Pass	FEMUR LOADS Driver left/right	FEMUR LOADS Passenger left/right
AMC JEEP COMANCHE Pick-Up	35.2/3555	1147/1636	50/nd	505/837	751/249
HONDA ACCORD DX 4-Dr Sedan	35.0/3062	909/712	nd/33	228/112	nd/nd
SAAB 9000 S 4-Dr Hatchback	34.9/3390	773/1443	71/46	484/nd	541/421
TOYOTA CELICA 2-Dr Coupe	34.9/2950	627/430	42/40	382/721	439/593
VOLKSWAGEN SCIROCCO 2-Dr Hatchback	35.0/2580	887/1070	52/nd	394/481	184/449

nd — no data

The National Highway Traffic Safety Administration (NHTSA) recently released the crash test results of five more 1986 motor vehicles in the agency's experimental New Car Assessment Program (NCAP). The first eight 1986 model crash test results were printed in the June DRIVER.

All the vehicles were crashed in frontal tests at 35 mph into a fixed barrier. This is 5 mph faster than the speed prescribed for compliance with several existing federal motor vehicle safety standards (FMVSS), including the automatic occupant protection requirements of standard No. 208, which will be phased in after Sept. 1. The crash tests are designed to indicate, for vehicles within the same size and weight class, relative levels of occupant protection and vehicle safety performance.

NHTSA said that the test results are intended to indicate relative crash protection provided to occupants wearing safety belts. The results of these 35 mph tests are not applicable to unbelted occupants. It also is important to emphasize that in the government's crash test program only one car of any given make or model is crashed in a specific test.

Subsequent crash test results for any vehicle could vary because of differences in the way cars are manufactured and equipped or due to slight variations in test conditions. Therefore, small differences in the results among vehicles should not be viewed as significant.

Instrumented dummies, protected by the vehicles' standard safety belt system are used in all tests. The head, chest and upper legs of the dummies are equipped with instruments which monitor impact forces and accelerations. The head acceleration is used to calculate the head injury criterion (HIC), a measure of the potential for head injury. The actual chest acceleration (in G's) is used as a measure of the potential for chest injury.

In general, the lower the HIC, chest G's and femur load, the less likely drivers and front-seat passengers would be seriously injured or killed in a frontal crash at 35 mph. A HIC value of 1,000, a chest deceleration of 60 G's (G is a unit of acceleration) and a femur load of 2,250 pounds, are the maximum values permitted in FMVSS No. 208. It must be noted that a 35 mph crash is one-third more severe than the 30 mph crash used in compliance testing, higher values are expected under NCAP testing.

The experimental New Car Assessment Program began in 1979. The agency is continuing to examine several aspects of the program, particularly the relationship of these tests to real-world accidents and injuries, in order to improve crashworthiness information provided to consumers.

CHAPTER I
In Which
Som Loses Lead
and
Pooher Says He'll Find It

The Pepper-and-Salt Off-Roader, Som Nam buList, stood by his highrise, four-by-four in an empty corner of the service station, his feet well apart, his head to one side, and thought about things. Sometimes he thought sadly to himself, "Why?" and sometimes he thought, "Wherefore?" and sometimes he thought, "Inasmuch as which?" — and sometimes he didn't quite know what he *was* thinking about. So when Ronnie-the-Pooher came stumping along, Som was very glad to be able to stop thinking for a little, in order to say, "How do you do?" in a gloomy manner to him.

"And how are you?" said Ronnie-the-Pooher.

Som shook his head from side to side.

"Not very how," he said. "My truck hasn't seemed to have felt at all how for a long time."

"Dear, dear," said Ronnie, "I'm sorry about that. Let's have a look at it."

So buList stood there, gazing sadly at the ground, and Ronnie-the-Pooher walked all around the utility vehicle once. Then he looked at the gasoline pump from which Som was filling the 4X4's tank.

"Why, what's happened to the lead?" he said in surprise.

"What has happened to it?" said Som.

"It isn't there!"

"Are you sure?"

"Well, either lead *is* there or it isn't there. You can't make a mistake about it. And yours *isn't* there!"

"Then what is?"

"Nothing."

"Let's have a look," said Som, and walked slowly round the pump, and then, finding himself back where he started, he walked round the other way, until he came back to where he was at first, and then he put his head down and looked between his legs, and at last he said, with a long, sad sigh, "I believe you're right."

"Of course I'm right," said Ronnie.

"That Accounts for a Good Deal," said buList gloomily. "It Explains Everything. No Wonder."

"**They** must have left it somewhere," said Ronnie-the-Pooher.

"Somebody must have taken it," said Som. "How Like Them," he added, after a long silence.

Pooher felt that he ought to say something helpful about it, but didn't quite know what. So he decided to do something helpful instead.

"Som," he said solemnly, "I, Ronnie-the-Pooher, will find lead for you."

"Thank you, Ronnie," answered buList. "You're a real friend," said he. "Not like Some," he said.

So Ronnie-the-Pooher went off to find Som's lead.

CHAPTER II
In Which
Pooher Listens To D.T.
— and Listens and Listens

It was a fine smoggy morning in the val-

ley as he started out. Little thoughts played happily in his empty mind, skipping from time to time in front of his consciousness as if they had come to stay, and then sliding away suddenly so that the next might have its turn. Through them and between them lead shone bravely. There was octane-enhancing properties and protection of exhaust valve seats in older engines from undue wear. Through the octane requirements and hydrocarbon emissions, Pooher marched; down engine rusting and corrosive wear, up spark-plug fouling, exhaust-valve burning and exhaust system corrosion into oil thickening and degradation: and so at last tired, and hungry, to the AF Inn, Southern California. For it was in the AF Inn, Southern California, that D.T. lived.

"And if anyone knows anything about anything," said Pooher to himself, "it's D.T. who knows something about something," he said, "or my name's not Ronnie-the-Pooher," he said. "Which it is," he added. "So there you are."

D.T. lived behind a door that had a notice which said:

ANSWERS . . .$1.00

ANSWERS that require Thought . . . $2.50

ANSWERS that require Research . . . $5.00

Correct ANSWERS . . . $10.00

Dumbfounded looks . . . FREE.

Ronnie-the-Pooher read the notice very carefully. Then he knocked and he called out in a very loud voice, "D.T.! I require an answer! It's Pooher speaking." And the door opened and D.T. looked out.

"Hallo, Ronnie," he said. "How's things?"

"Terrible and Sad," said Ronnie, "because Som, who is a friend of mine, has lost his lead. And he's Moping about it. So could you very kindy tell me how to find it for him?"

"Well," said D.T., "the Environmental Protection Agency has —"

"What does Envy Ron Metal Protraction Against C mean?" said Ronnie. "For I have Very Little Brain, and long words Bother me."

"It means the EPA."

"As long as it means that, I don't mind," said Ronnie humbly.

"The EPA issued rules which will —"

"Just a moment," said Ronnie, holding up his paw. "*What* did they do to this — what you were saying? You sneezed just as you were going to tell me."

I *didn't* sneeze."

"Yes, you did, D.T."

"Excuse me, Ronnie, I didn't. You can't sneeze without knowing it."

"Well, you can't know it without something having been sneezed."

"What I *said* was, 'EPA *Issued* Rules.' "

"You're doing it again," said Ronnie sadly.

"Rules!" said D.T. very loudly. "Which reduced the lead content of gasoline from 1.1 to no more than 0.1 gram of lead per gallon."

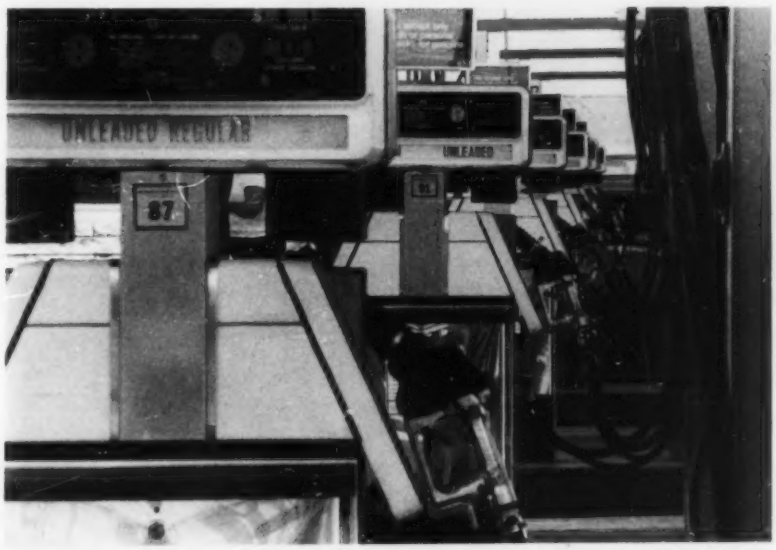
"I see, I see," said Ronnie, nodding his head. "Talking about gallons," he went on dreamily, "I generally have a small cup of something about now — about this time in the morning," and he looked wistfully at the coffee pot in the corner of D.T.'s office; "just a paper cup of coffee with nothing in it —"

"Well, then," said D.T., "the EPA has also proposed a complete ban on the use of lead in gasoline, to become effective in 1988."

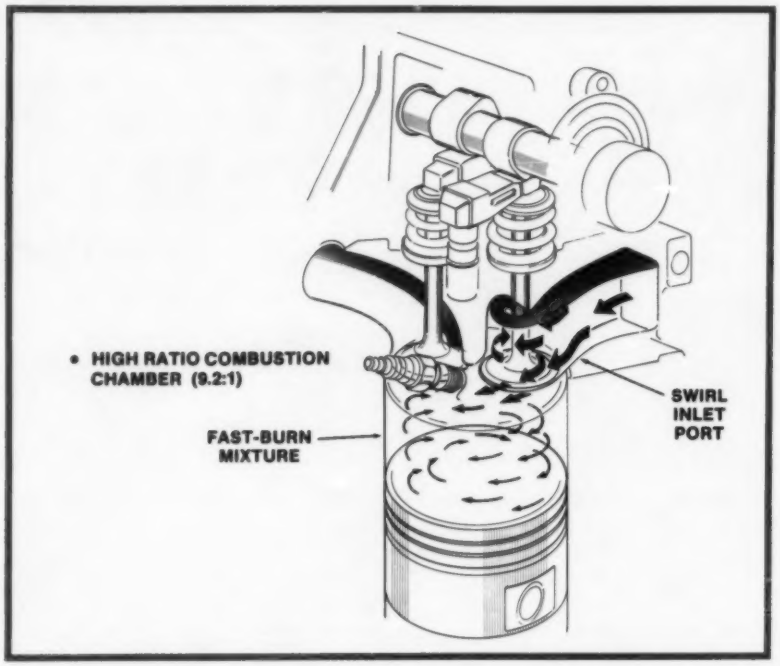
"A half cup of coffee," murmured Ronnie to himself, "or — or not, as the case may be." And he gave a deep sigh, and tried very hard to listen to what D.T. was saying.

continued

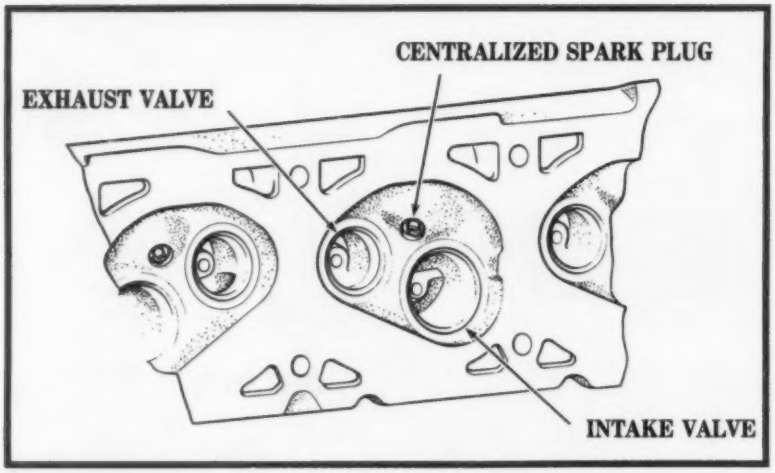
Come 1988 the "unleaded" may come off these signs as there may no longer be any such thing as "leaded" gasoline.



The octane number of a fuel is a measure of its resistance to preignition and knocking.



To prevent excessive deposit buildup, "scavengers" are added to leaded fuels to help remove lead from the engine after combustion.



Hardened valve seats reduce wear from 75 to 95 percent.

But D.T. went on and on, using longer and longer words, until having referenced 58 reports, papers, magazine articles and personal communication at last he came back to where he started, and he explained that "based on this experience, it does not appear that valve-seat recession will be a major problem, even if all the lead is eliminated from gasoline.

"Furthermore, you see, the switch to unleaded gasoline should provide significant benefits in the form of reduced maintenance costs and increased engine life."

For some time now Ronnie had been saying "Yes" and "No" in turn, with his eyes shut, to all that D.T. was saying, and having said, "Yes, yes," last time, he said, "No, not at all," now, without really knowing what D.T. was talking about.

"Don't you see?" said D.T., a little surprised. "Listen and I'll explain it again."

So he did.

CHAPTER III
In Which
By Mech Listens for Knock
but
Hears Ping

By Mech had spent the morning at his desk driving hot laps at Riverside, and he had just pulled into the pits and was wondering what it was like outside, when who should come knocking at the door but Som Nam buList.

"Hallo, Som," said By Mech, as he turned around in his chair. "How are *you*?"

"It's smoggy still," said buList gloomily.

"Is it!?"

"*And* hot."

"So it is."

"Yes," said Som. "However," he said, brightening up a little, "we haven't had a meltdown locally."

"What's the matter, Som?"

"Nothing, By Mech. Nothing important. I suppose you haven't seen any regular gasoline about?"

"What sort of regular?"

"Just leaded."

"Who needs it?"

"I do. At least I thought I did. But I suppose I don't. After all, we can't all have leaded regular."

"But, Som, I didn't know — I always thought —"

"I don't know how it is, By Mech, but without all the lead and one thing and another, my engine will knock. It will, if you know what I mean — rapidly wear the valve seats without lead. In fact, By Mech," he went on in a loud whisper, "quite-between-ourselves-and-don't-tell-anybody, I can't live without lead."

"Oh, Som!"

"And I said to myself: The others will be sorry if I'm getting my engine all messed over. They haven't got Brains, any of them, only grey fluff that's blown into their heads by mistake, and they don't Think."

"Oh, Som!" said By Mech, feeling very sorry already.

"I don't mean you, By Mech. You're different. So what it all comes to is that I look at octane numbers on the pumps."

"Do you really? How exciting!"

"The really exciting part," said Som in his most melancholy voice, "is that when I last filled up leaded regular was 89 octane, and when I came back it was unleaded regular at 87. Not at all, very natural, and I must have been the only one using it. But still I just wondered."

By Mech didn't stop to wonder. He quickly changed into his street clothes.

"We'll go and listen for your knock at once," he called out to Som. "Come on."

And off they hurried, and in a very little time they were lumbering up the freeway pass in the 4x4.

"There!" said Som. "A knock!"

"I can't hear it," By Mech said.

"There it is again!"

"Oh," said By Mech, "that occasional ping that you get that tells you you're getting the max out of a gasoline."

"No, it's an engine destroying *knock*!"

"Despite the two points difference in octane numbers," By Mech tried to explain, "most engines designed to use leaded regular will run without undue knocking on unleaded regular when they're properly tuned."

"Not this one!"

"Well," replied By Mech, "if it doesn't run satisfactorily on the lower-octane fuel, higher-octane unleaded premium gasoline is readily available."

"How high?" asked Som.

"Ninety-one or greater."

"What is the price?" Som asked. "Will I laugh when you tell me?"

By Mech didn't answer.

CHAPTER IV
In Which
We Are Introduced to Recession and Wonder Why?

Ronnie-The-Pooher was sitting at his desk, reading technical reports, when there came a knock on the door.

"Nineteen-60," said Ronnie. "Come in. Nineteen-60. Or was it 1974? Bother. That's muddled me."

"Hallo, Ronnie," said Fecher.

"Hallo, Fecher. Nineteen-60, wasn't it?"

"What was?"

"The year that since nearly all heavy-duty truck engines have been built with hard valve-seat inserts."

"Nineteen-60, that's right."

"Are you sure?"

"No," said Fecher. "Does it matter?

"I just like to know," said Ronnie humbly. "So as I can say to myself: 'I've got hardened valve seats. Or hard valve-seat inserts, as the case may be. Both of which prevent valve-seat recession.' It's sort of comforting."

"Well, let's call it 1974," said Fecher. "That way you can say nearly all engines built since then have had one or the other. By the way, Ronnie, do you know what 'valve-seat recession' is about?"

"I don't think so," said Ronnie. And then, after thinking a little more, he said: "What is it?"

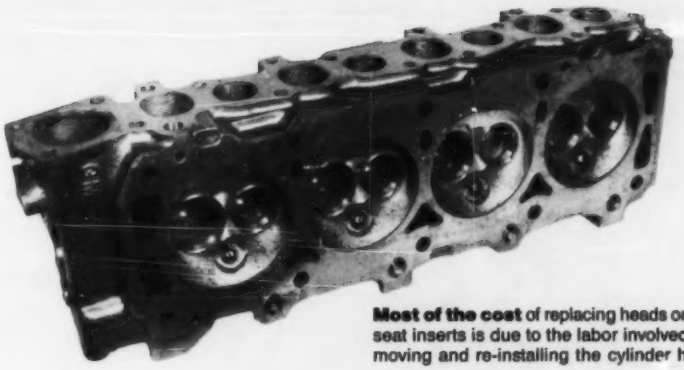
" 'Valve-seat recession' is rapid wear of the valve seat. Numerous laboratory tests have shown that engines suffer this when using unleaded fuel. It is most serious during prolonged operation at high speeds and loads," said Fecher carelessly.

This didn't help Ronnie much, because Fecher had so many laboratory test reports, and of such different sorts and sizes, that he didn't know whether he ought to be believing them or not.

"I haven't heard of any laboratory tests," said Ronnie, "not so as to say, 'Hallo, Recession.' Do you know of any other kinds of tests?"

"Numerous in-use tests," said Fecher, "(most of which were undertaken before the 55 mph speed limit) have shown lit-

continued



Most of the cost of replacing heads or valve-seat inserts is due to the labor involved in removing and re-installing the cylinder heads.

Before the advent of unleaded gasoline, engine rusting was one of the most significant and widely-spread problems.

Because of the EPA ordered reduction in lead content, what used to be 89 octane leaded regular is now 88 octane.

Higher-octane unleaded premium gasoline is available to meet the needs of those engines that won't run satisfactorily on lower-octane fuel.

tle valve-seat recession in normal use."

"Oh, I see," said Ronnie. "Are there any others?"

"Well," said Fecher, "a number of organizations have successfully used unleaded regular gasoline in engines designed for leaded fuel," he went on importantly "By Mech told me that modern high-ash motor oils and special fuel additives can reduce or eliminate valve-seat recession in those engines which are susceptible to it."

CHAPTER V
In Which
An Engine Is Rebuilt
at
No-Lead Corner

"I've been thinking," said Ronnie, "and what I've been thinking is this. I've been thinking about Som Nam buList."

"What about Som Nam buList?" asked Neb U. Lous.

"Well, poor Som has no hardened valve seats."

"So he doesn't," said Neb.

"So valve-seat recession *might* be a problem, Neb. And some unusual groups of engines, which are used under severe conditions of continuous high speed and load, and which do not have hardened valve seats, *might* suffer from this. So what I've been thinking is: Let's fix his engine for him."

"How?"

"Where valve-seat recession does occur," Ronnie went on, "it can be repaired, and further recession prevented, by replacing the cylinder heads with heads having hardened seats, or by machining out the valve seats and installing hardened insets."

"Sounds expensive," said Neb.

"Either procedure would cost about $500 to $600."

"That," said Neb, "is a Grand Idea. Where shall we do it?"

"We will rebuild his engine here," said Ronnie, "just by this service station, out of the weather, because this is where I thought of it. Here at the House at No-Lead Corner."

CHAPTER VI
In Which
We Leave Without Lead

"Why, here *is* Som," said Ronnie, when he had finished exchanging hand gestures with By Mech, and he nudged Neb, and Neb nudged him, and they thought to themselves what a lovely surprise they had got ready.

"Hallo, Som."

"Same to you, Ronnie-the-Pooher, and twice on Thursdays," said Som gloomily.

Before Ronnie could say: "Why Thursdays?" By Mech began to explain the sad story of Som's Lost Lead. And Ronnie and Neb listened, and their eyes seemed to get bigger and bigger.

"Don't you think unleaded gasoline could produce a number of beneficial effects, even in engines originally designed for leaded fuel?" asked Ronnie.

"Such as?" asked Som.

"It would greatly reduce valve problems because of deposit buildup and overheating."

"It would?"

"And would all but eliminate engine rusting."

"Really?"

"This would extend engine life and reduce repair costs," said Ronnie, "probably more than offsetting any increase in valve-seat recession."

"Oh!" said Neb.

"What?" said Som.

"I just said 'Oh!' " said Neb nervously. And so as to seem quite at ease he hummed once or twice in a I-am-up-to-something-now kind of way.

"Corrosive wear of bearings, cylinder bores, and piston rings would also be greatly reduced from that experienced with conventionally leaded fuels," said Ronnie. "Although ring and cylinder wear might be slightly greater than with the present low-lead gasolines."

"Of course," said Ronnie. And he murmured to himself, "No brain at all, some of them."

"What are you talking about, Ronnie?" asked By Mech.

"Well," said Ronnie . . . "That fact *is*," said Ronnie . . . "Well, that fact *is*," said Ronnie . . . "You see," said Ronnie . . . "It's like this," said Ronnie, and something seemed to tell him that he wasn't explaining very well, and he nudged Neb again.

"It's like this," said Neb quickly. . . . "Reduced oil thickening with unleaded, combined with the reduced corrosion and wear, would also allow a significant extension of oil drain periods."

"What for?"

"For further direct savings," answered Neb. "As well as reducing maintenance costs for owners who do not change their oil often enough."

"*I* don't change my oil often enough?" disagreed Som. "I change my oil very often enough, thank you!"

"No," said Neb firmly. "This would be longer."

"Because of being unleaded," said Ronnie.

"But I ought to *know* —"

"Look," said Neb simply. "Unleaded gasoline extends the service lives of the spark plugs and exhaust systems significantly."

"And *nearly* eliminates exhaust system corrosion in warm climates," said Ronnie.

They explained what they had done to Som's engine.

"There you are," said Neb.

"Inside as well," said Ronnie proudly.

Som got inside, drove away . . . and came back again.

"It's a remarkable thing," he said. "It is my truck, as good as ever. In fact, better in places."

"Much better," said Ronnie and Neb together.

"It just shows what can be done by taking a little trouble," said Som. "Do you see, Ronnie? Do you see, Neb? Brains first and then Hard Work. Look at it. *That's* the way to build a truck," said Som proudly.

So they left him with it; and By Mech went to lunch with his friends Ronnie and Neb. And on the way they told him how Greatly Exaggerated the potentially detrimental effects of eliminating leaded gasoline appeared. And they told him how the potentially beneficial effects have been either understated or ignored. And when he had finished laughing, they all thought how the widespread public alarm over unleaded fuel has little foundation in fact.

"And I know it *seems* easy," said Neb to himself, "but it isn't *everyone* who can understand it."

Leaded gasoline is well known to have two harmful effects on sparkplugs: fouling and chemical corrosion.

(EDITOR'S NOTE: The factual information presented in this story is from SAE Technical Paper Series #860090 "The Effects of Low-Lead and Unleaded Fuels on Gasoline Engines," by Christopher S. Weaver, Radian Corp. The paper is available for $4.50 by writing: SAE, 400 Commonwealth Drive, Warrendale PA 15096.)

The present widespread public alarm over the effects of the banning of lead has little foundation in fact.

Backfire LETTERS TO THE EDITORS

A MESSY JOB?

I read your fine publication every month and look forward to your informative articles, interesting stories and important safety tips. I especially like your "Backyard Mechanic" feature. But I feel you gave some information that was in error in the April '86 issue. I was reading the article about turbo-chargers and couldn't believe it when you said to fill a new oil filter with oil before installation. One, this is totally unnecessary, especially if you crank the engine until you get oil pressure (or the light goes out). Two, this is a very messy job. Most of today's cars have oil filters that go on almost horizontally, so if you fill the filter with oil, most of it will drain out before the filter is tight enough to hold it in. Also when you crank the engine, if the light goes out or you have pressure then there is oil in the filter (it goes to the filter before it gets to the pressure sender).

A1C Russell Johnson, USAF
Castle AFB, CA 95301

Good quality oil filters have check valves that keep all but a minute amount of fluid from leaking out while they're being installed. Besides, when it comes to replacing a damaged turbocharger or engine, it's better to be safe than sorry. In other words, "fill the oil filter with oil before installation."

BRAIN BUCKETS

I would like to compliment you on your fine magazine. DRIVER is one of the few magazines that I feel is truly worthwhile as far as safety-oriented reading material is concerned. I read every issue that is made available to me, and insure also that my troops read them.

I'm 29 years old, have been riding for 20 years and driving for 13 years. I've had one moving violation (60 in a 55) some 12 years ago. I have been down five times on bikes and hit three times while driving. In none of these accidents was I found to be at fault. It was always the "other guy" that was responsible for my pain.

I am and have been a firm believer in "brain buckets" ever since my best friend was killed while we were competing in a local trials-riding competition. We didn't wear helmets for trials back then (1972) and didn't think them necessary because of the snail's-pace riding we were involved in. My friend went down in a sand wash and struck his head on all that "soft sand." His estimated speed prior to going down was four mph. He was killed on impact. No broken bones, no cuts, no scrapes, nothing visibly wrong, he was just dead. The coroner's report confirmed that the "slow speed" endo is what killed him.

Since then I have worn a helmet any time *I got on* a motorcycle. If four mph in soft sand will kill a person, then merely falling over while straddling a bike will do the same. Helmets (and seat belts) may be uncomfortable at times but I'm alive, at least, to feel uncomfortable. Every time I've been down on a bike my helmet has saved my noggin from harm.

Seat belts saved my life at least once. I am being processed for a medical discharge now because of neck and back injuries from an auto accident some 2.5 years ago. The police and paramedics both assured me that without the seat belts I was wearing the impact of the collision would probably have killed me. So even though I suffer some minor disability because of the accident, I'm alive, well and able to live a normal life with my wife and children.

Keep up the good work you're doing.

SSgt Victor S. Sturdivant, USAF
Tustin, CA 92710-6051

INTERCOOLER

Enjoyed your article "Living With a Turbo" (April 86). It definitely added to my understanding of my 1986 Thunderbird Turbo Coupe.

As an addendum to the article, could you have the Backyard Mechanic explain the function and operation of a turbo intercooler? I have seen ads offering an intercooler as an add-on device for my '86 T-Bird and I was wondering about its efficacy.

CMSgt Jerome T. Czeikus, USAF
Victorville, CA 92392-2031

If you can tell the difference in the horsepower your T-Bird produces on a cold, humid day versus its output on a hot, dry day then you might consider an intercooler. Otherwise, forget it.

PARTICLE MASKS

After reading the articles in the Backyard Mechanic section entitled "Brake Jobs" and "Good Brakes," I made the decision to write you and say that I enjoyed them very much. The article "Brake Jobs" was well written. It brings out the need to prepare for any job, and that help is sometimes needed, and not to let pride get in the way when help is offered. Besides, someone helping you always makes the job safer than alone.

In "Good Brakes" you brought out the right way to do the job. I am a mechanic for the Army. I got into the job 12 years ago when my dad said that "I could have a car but I had better learn how to fix it on my own because I could not afford to pay to have it fixed." Your articles are always good and must help a lot of people; I like that. But in "Good Brakes" it should have been mentioned that brake pads, brake shoes and clutches are often made of asbestos and as the parts wear they make dust, and that this dust can cause harm if breathed. One should wear a particle filtering mask when working with these parts. If a mask cannot be found, a damp cloth tied around the nose and mouth is better than nothing.

SP/4 Alan Crimmins
APO NY 09117

RATIONAL DECISION

I have been an avid reader of your magazine for years now. Many of the stories and articles I find interesting, and pass on to others. The topic of motorcycling especially interests me. I try to stay on top of any new safety topics.

I have been riding for five years now, working my way up to the 1100cc I currently own. During my three years in the Air Force I have accumulated over 37,000 accident-free miles on different cycles. This can be attributed to safety courses and literature I have been exposed to. As a college graduate, I feel I can make rational decisions. Being a motorcyclist is one of those decisions.

I have taken my cycle on several TDYs in different locations, including populated Miami. My supervisors have expressed concerns but have not stopped me from taking my two-wheeled POV.

I read, with great interest, LCDR Steve

Phillips' letter in the April '86 issue. This too is my first letter to the editor, for any publication. LCDR Phillips was very diplomatic in his letter, a far cry from many one-sided "Backfires." His refreshing letter offers an alternative, not just a gripe, as most do.

As for LCDR Phillips' opinion concerning urban cycling, I tend to agree, thinking of the inexperienced cyclist. However, personally I find it easier to maneuver, accelerate, and even stop my cycle than I do my car.

As I have learned in safety classes and have read in literature, most cycle/car collisions occur at intersections. *Every time* I approach an intersection, I expect the worst. Living in an area where there are a lot of elderly people, I'm especially concerned with them, since many are not alert to motorcyclists.

Occasionally I drive my car and view motorcyclists as other motorists do. I do admit they are not as visible as cars, but I can't believe the statement "I didn't even see him."

After two *minor* "close calls," I evaluated both, determining that the first I could have been more attentive, and the second I responded correctly. Both were at an intersection.

In closing, I will continue to be an avid cyclist, riding year-around. I am glad that a non-motorcyclist, LCDR Phillips, shows concern for motorcyclists. I *do not* feel I am "taking an unnecessary risk in the name of freedom of choice."

SrA Kevin Thiem, USAF
Seymour Johnson AFB, NC 27531-5366

ROLLING COUCH

I found the letter from LCDR Phillips (April issue) to be quite informative. And I do agree with him on quite a few points. But I'll have to dispute his opinion that motorcycles are not appropriate for urban driving. Granted, city driving is extremely dangerous, but a motorcycle can handle almost any driving situation if the operator drives within his/her limits and allows for the driving conditions. An excellent way to determine those limits and learn what to do in different riding situations is to attend the Motorcycle Safety Foundation's Motorcycle Rider Course. Maybe if more people were interested in learning from the experts, those three motorcycle accident victims which he helped bury would still be walking around today.

We bikers have to allow for the vast majority of untrained or downright incompetent drivers on the roads. I'm not trying to say that the entire fault is with the auto and truck drivers. But statistics from the Hurt study conducted by Dr. Harry Hurt of the University of Southern California do indicate that 54% of all multiple vehicle motorcycle accidents result from negligence on the part of the auto driver. And I do realize that a motorcycle is a bit more difficult to see on the road than a car. But some of the people on the streets tend to drive by autopilot. An example is the driver who looks straight through you at a clear, unobstructed intersection and then slams on the brakes when a motorcycle appears in front of him out of nowhere. Impossible? No, because it has happened to me and more than a few of my riding companions. Or how about the driver that checks both ways out of the corners of his eyes (I did not see his head move from a looking straight ahead position) then proceeds across the intersection causing the motorcycle to take evasive action. Again, this was a real situation.

Actually, the heart of the matter is proper training for both motorcycle and automobile operators. I would be strongly in favor of mandatory training for both. Unfortunately, only motorcycle training is available for those wise enough to take advantage of it. My own opinion is that this training is advantageous to everyone, including those who do not wish to ride. It's amazing how your powers of observation increase when not hiding within a ton and a half of rolling couch.

As I have come to learn recently, the unofficial Air Force policy is to discourage the use of motorcycles. There is some logic to this attitude. But it does not take into consideration the fact that motorcycling is a very popular pastime and will not go away. Instead of waiting for us to become victims, help us to make the roads a little safer for everyone.

SSgt Christopher J. Schwehr, USAF
Scott AFB, IL 62258

THE AMERICAN WAY

I was glad to see in your April issue that Ford has taken a reasonable approach on the air bag issue. I wholly agree that they should be offered as optional equipment. If you feel that they are worthwhile, fine, spend the $815 for them and enjoy. If you are someone who uses the seatbelts which are installed in all cars, and feel air bags are a needless expense, fine, don't buy the optional air bags.

It makes sense to let the consumers, not special interest groups or the federal government, decide whether air bags are desirable. If a large number of people want the optional air bags on the Tempo and Topaz models they are now offered on, Ford should then consider making them an option on more or all models. If, on the other hand, few people order them as an option, Ford should refuse to honor any attempt by the federal government or some other group to have air bags installed as mandatory equipment.

The reasonable compromise to the air bag issue is to let them be optional equipment. Those who feel they are desirable can purchase them. Those who do not want them, will not buy them. Freedom of choice, the American way.

Capt Walter F. Hern, USAF
Hill AFB, UT 84056-5999

BACKWARD STAFF

The February 1986 issue of Driver Magazine was very good. And while it may seem insignificant, there is an error on the back cover.

Incorporating music and seat belt safety was very creative. However, the music staff is incorrect. The "FACE" should actually be "ECAF" and "Every Good Belt Deters Fatalities" should also be reversed. The lines and spaces of the staff are:

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Capt. Ramona F. Key, USAF
North Syracuse, NY 13212-3421

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Children Should be Seen,
Not Hurt!

U·M·I

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